Planning and evaluation of sustainability in transport

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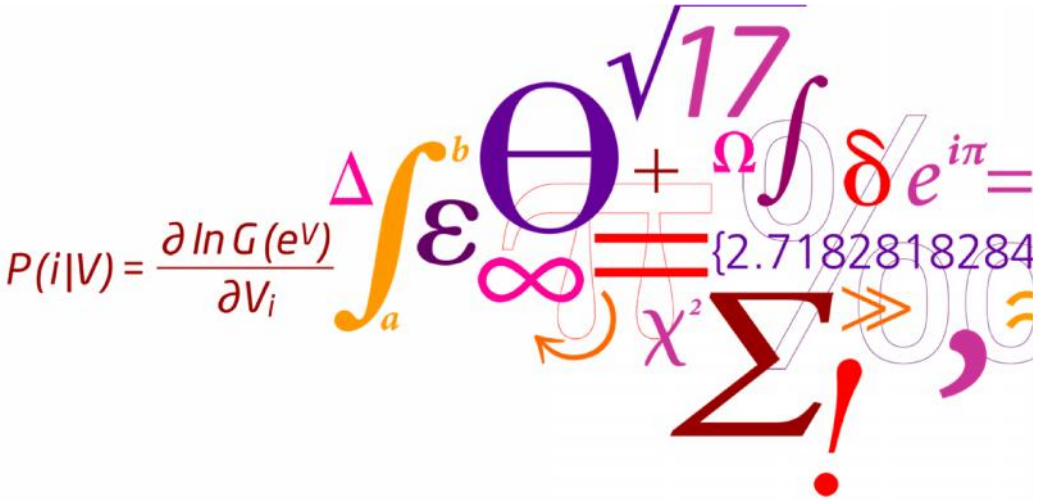


DTU Transport
Department of Transport

Overview

1. Introduction and general approaches

2. Brief overview ofsome projects related to sustainability

3. Examples from research
   - Decision analysis and support
   - Policy Influence of indic ators
   - National Sustainable Transport Planning

4. Some perspectives

1. Introduction and general approaches

- Sustainability or sustainable transport is not a designated research theme at DTU transport, but considered in many research projects/acitivities

- Emphasis in this presentation on sustainability related work within the research theme ‘Governance and appraisal’ (ca 10 members)

- No agreement on if and how ‘sustainable transport’ should be defined.

- Broadly two approaches:

  – Plannning for ‘green’ transport modes, land use patterns, or alternative mobility behaviours

  – A performance based approach with focus on the operationalization and application of sustainability principles, criteria, indicators for assessment, monitoring, evaluiation, etc

Some overall research questions

- How can transport appraisal be valid, non-biased, and lead to transparant results rather than seem to emerge from a 'block box'?
- How to ensure that project apprisals cover all relevant itmes in the best way in a particular context (= comprehensive assessment)?
- How to operationalize and integrtae sustainability into indicators, tools and institutions for policy making and planning?
- How do information, knowledge tools, and indicators actually influence governance and implementation of transport policies?
- How do the institutional and organisational frameworks affect the implementation and sustainability of transport policies and plans

Key dimensions of decision making for sustainable development

- Time: Consideration of long term impacts (concern for future generations; sustainability), as well as present development
- Space: Consideration of large scale impacts as well as local ones
- Multi-functionality: Preserving economic, social and environmental pillars for sustainability and development
- Risks: Attention to potential irreversible impacts
- Ambiguity: Ambivalent goals, Uncertain knowledge, Distributed power
- Institutions: Challenge of integrated decision making
- Governance: Promotion of participation of major social groups in the development processes

=> Complexity as a key condition

General principles for sustainable development

INSTITUTIONAL DIMENSION

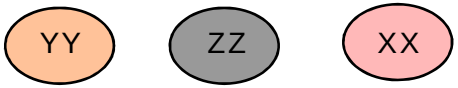
- Integrate decision making
- Ensure participation of major groups

	ECONOMIC PILLAR	SOCIAL PILLAR	ENVIRONMENT PILLAR
PRESENT GENERATION (Development)	• Ensure rising income level for the present generation • Ensure fair distribution	• Ensure human well-being and development; • Ensure fair distribution and eliminate poverty	• Ensure environmental quality for the present; • Ensure environmental justice
Fair distibution between generations			
FUTURE GENERATIONS (Sustainability)	• Safeguard income opportunities for future generations (economic capital)	• Maintain capacity for interaction and stability of social systems (social capital)	• Protect nature's life-support systems and resources (Ecosystems, Climate, Biodiversity)…

Evaluation frameworks

- Substantial aspect : What to evaluate?

  (what problem, which impacts, what system...?)



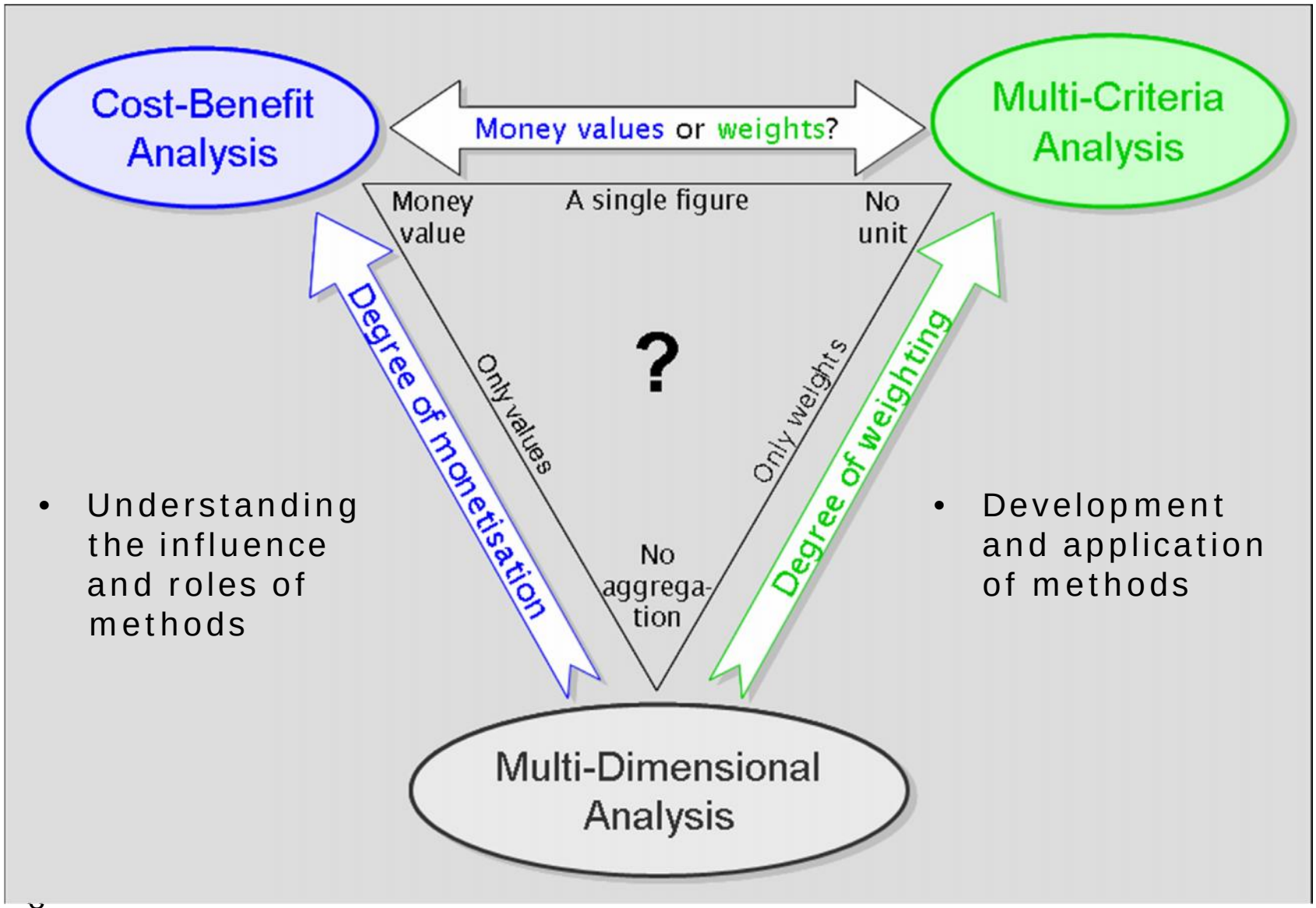
- Intentional aspect : Why to evaluate?

  (what purpose, which applications, which users...?)

- Procedural aspect : How to evaluate?

  (how to collect and present data; how to aggregate, how and when to report...)

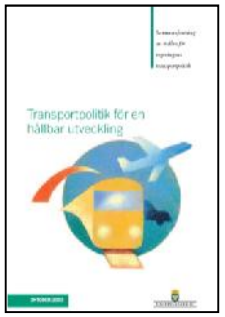
Evaluation methods



- Understanding the influence and roles of methods
- Development and application of methods

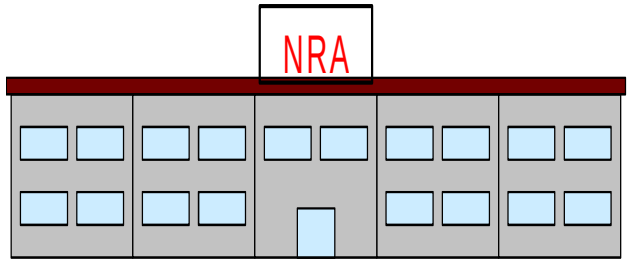
Performance levels

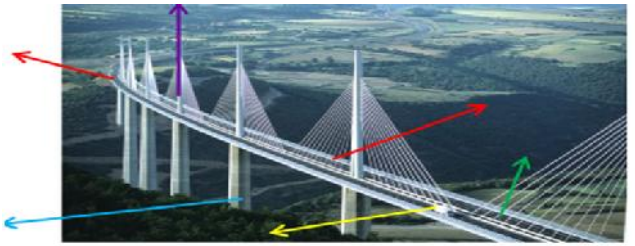
POLICY LEVEL

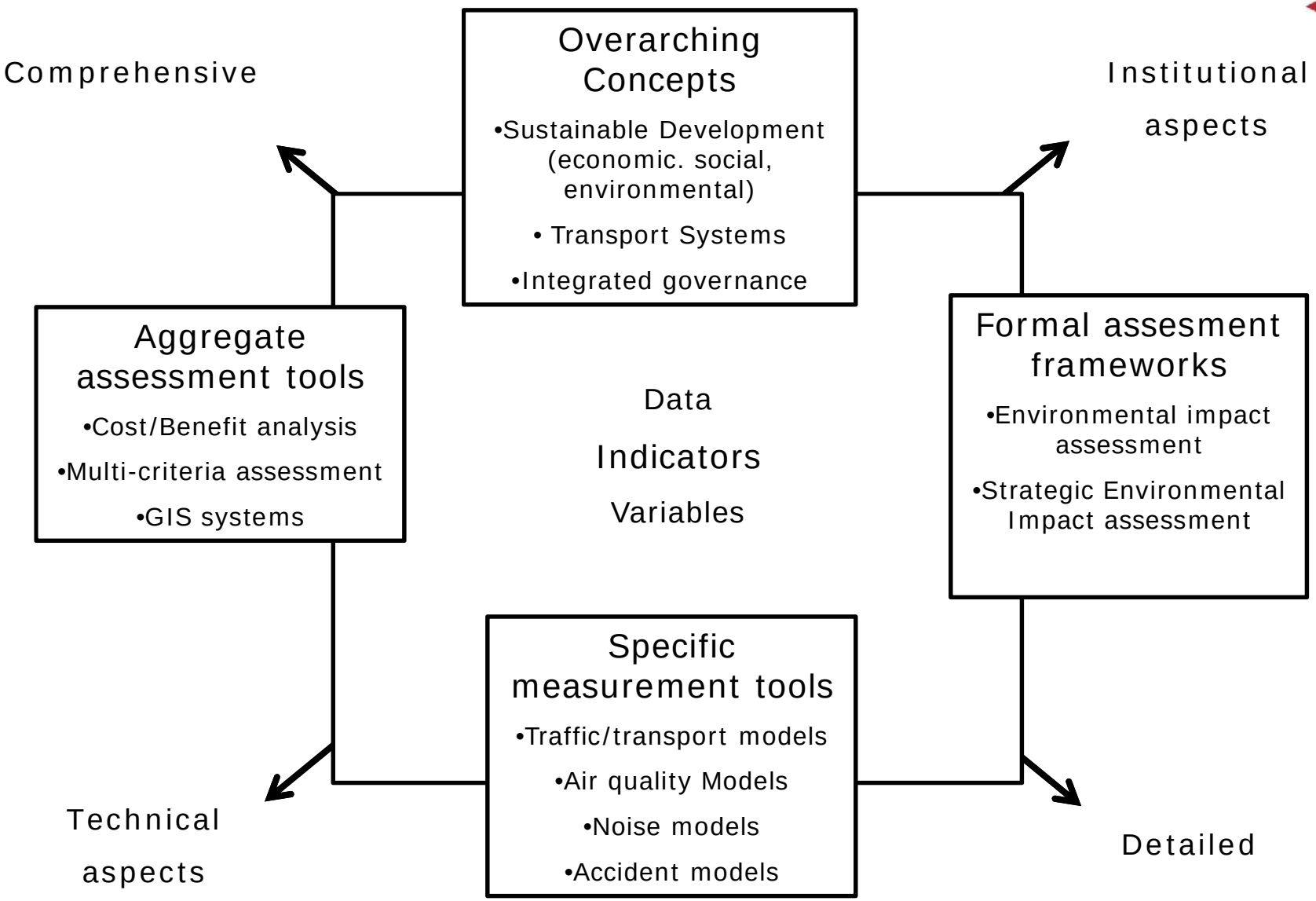


ORGANIZATIONAL LEVEL

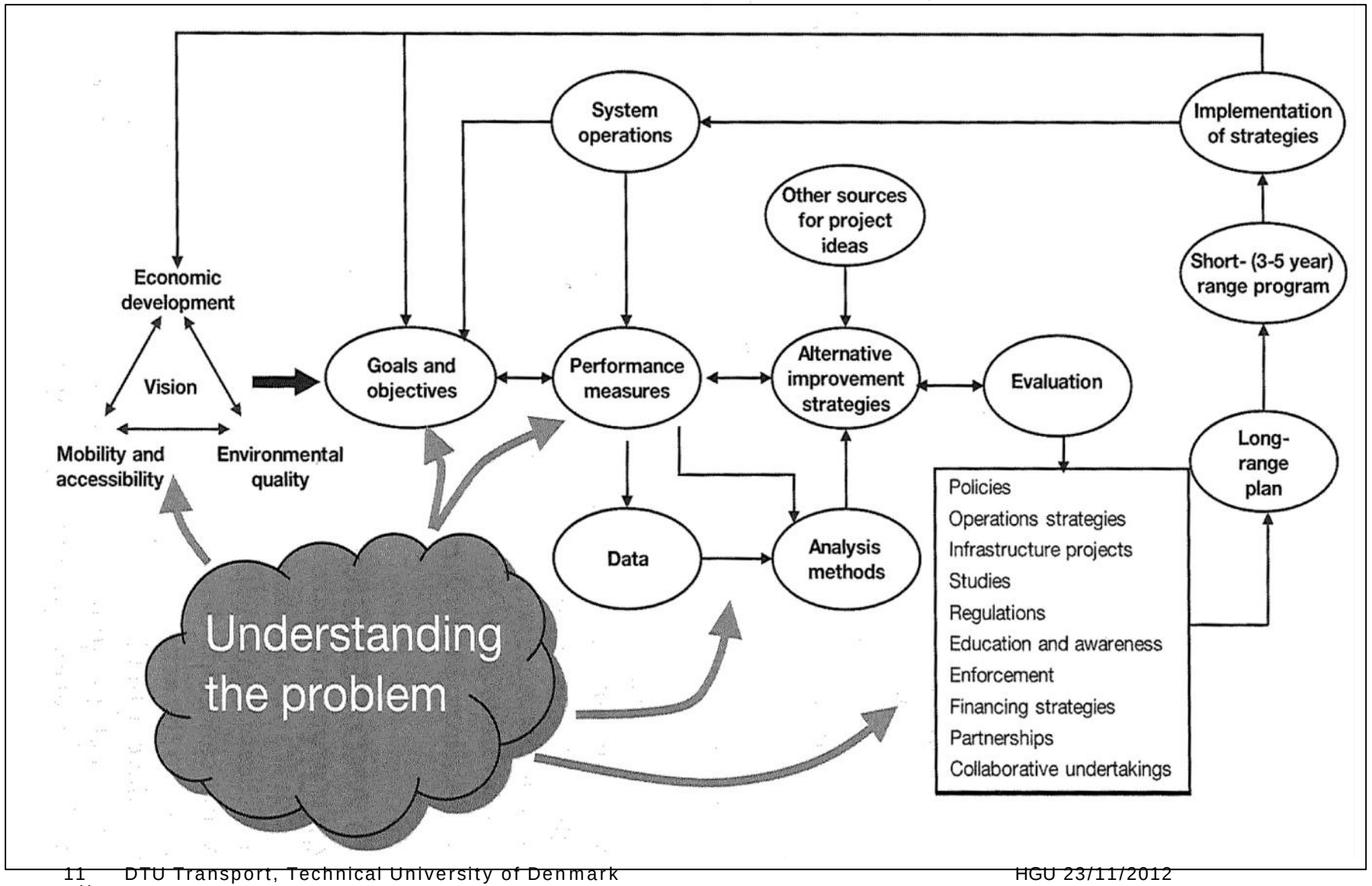
PROJECT LEVEL






Comprehensive
Overarching Concepts
•Sustainable Development (economic. social, environmental)
• Transport Systems
•Integrated governance
Institutional aspects
Aggregate assessment tools
•Cost/Benefit analysis
•Multi-criteria assessment
•GIS systems
Data
Indicators
Variables
Formal assesment frameworks
•Environmental impact assessment
•Strategic Environmental Impact assessment
Specific measurement tools
•Traffic/transport models
•Air quality Models
•Noise models
•Accident models
Technical aspects
Detailed

Transport Planning Process (Meyer & Miller 2000)



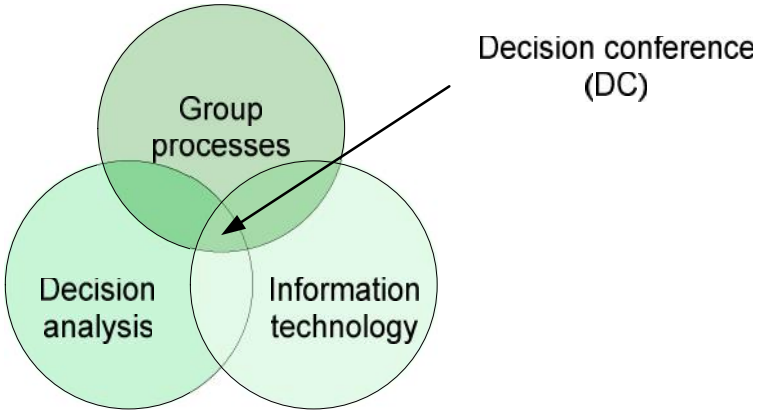
2. Brief overview of some projects related to sustainability

Øresund Ecomobility	INTERREG 2010-12	Decision models about green logistics chains and urban consolidation centres
UNITE	Strategic Research Council 2009-13	Uncertaincies in transport decicsion making
Optimising Transport Decision Making	PhD	Multicriteria analydis and decision conferences
Assessing robustness	PhD	Combining socio economy with political acceptability
* Impact *	MISTRA Foundation 2005-08	Barriers for implementing sustainable solutiuons
* COST 356	COST 2006-10	Environmental sustainability indicators for transport
POINT	EU FP7 2008-2011	Policy Influence of Indicators
OPTIC	EU FP7 2009-11	Designing optimal policy packages
* SUNRA; SBAKPI	ERANET 2011-2014	Sustainability for road administrations
* SUSTAIN	Strategic Research Council 2012-2016	National Sustainable Transport Planning – new framework

3. Examples: Decision analysis

2007-2012 the Decision Modelling Group (Leleur et al) has developed the Decision Conference (DC) approach

Involves adjusting and optimising the interplay of
- I: decision analysis (DA) techniques,
- II: group processes and
- III: interactive IT



Further developed in PhD 'Optimising Transport Decision Making...'

- Based on parctical cases the thesis recommends a framework consisting of process and techniques for optimising transport decision making

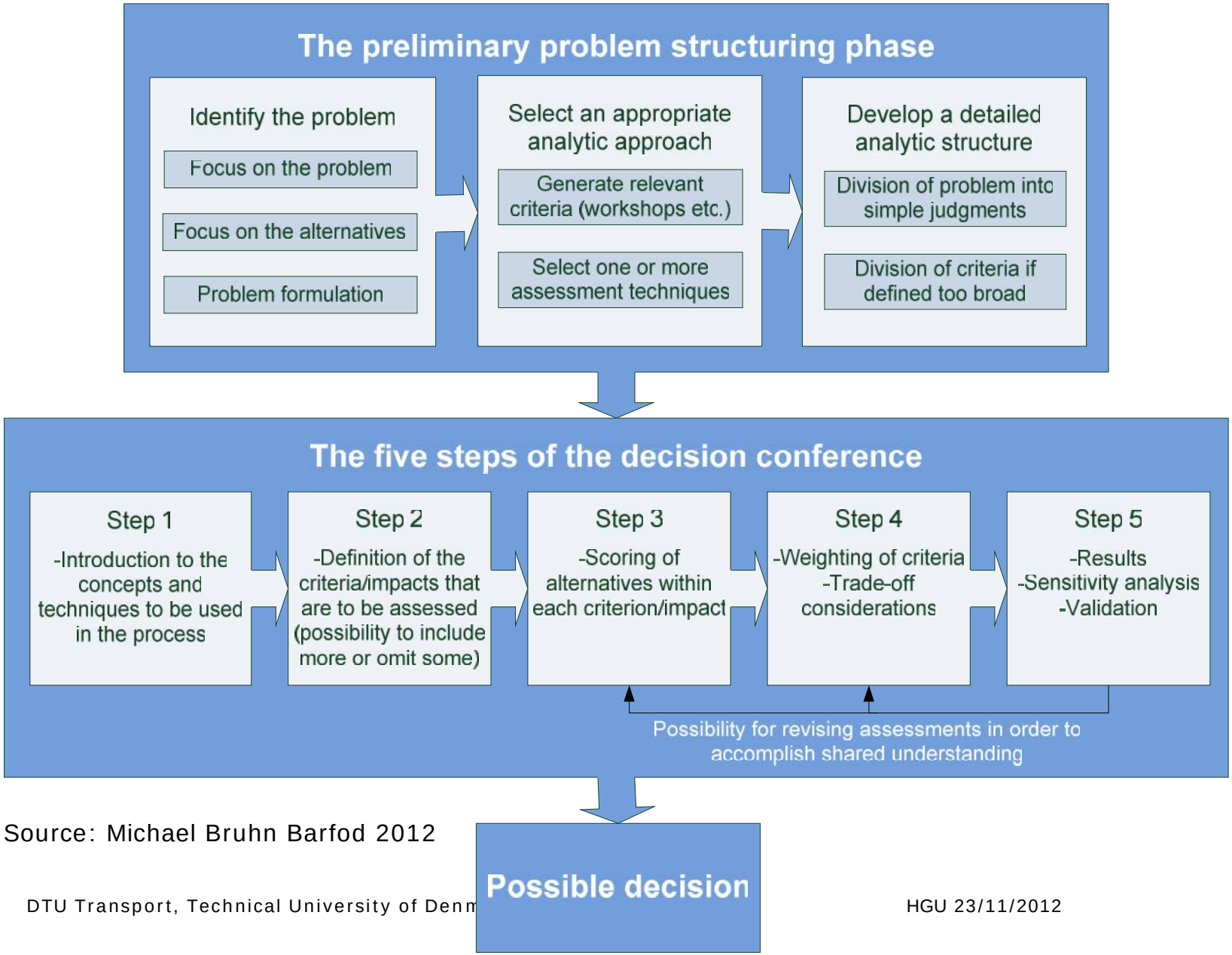
- The combination of these approaches is useful for structuring and appraising large and complex decision problems with participation of relevant stakeholders and decision-makers

- Regerading decision analysis techniques, distinction is recommened:
  - Basic-user mode
  - Expert-user mode

	Basic-user mode	Expert-user mode
Criteria weights	SMARTER	Swing weights
Alternative scores	REMBRANDT	SMART / REMBRANDT

Source: Michael Bruhn Barfod 2012

Findings relating to examination process



Source: Michael Bruhn Barfod 2012

Example: Policy influence of indicators

Overall aims were to,

- Explore if and how indicators are used in policy making
- If the use of indicators has influence on policy
- What role the information plays

Use:

- Indicators are observed processed and referred to

Influence:

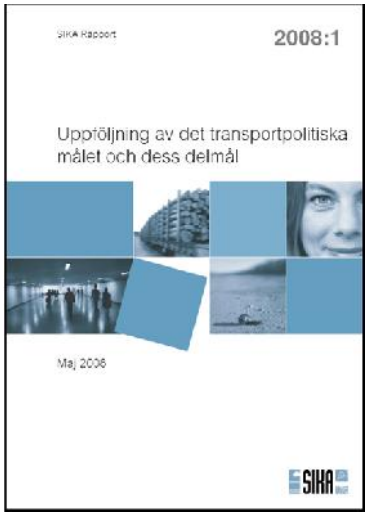
- Indicators affect policy content (goals, measures), or processes

Roles:

- Instrumental: Indicators have direct influence on decisions
- Conceptual: Indicators increase knowledge or create new ideas
- Symbolic: Indicators justify existing decisions

Two transport cases studied

- Sweden: Indicators in annual reports that Follow-up on the Swedish Transport Policy Objectives (Focus on 2008-report)

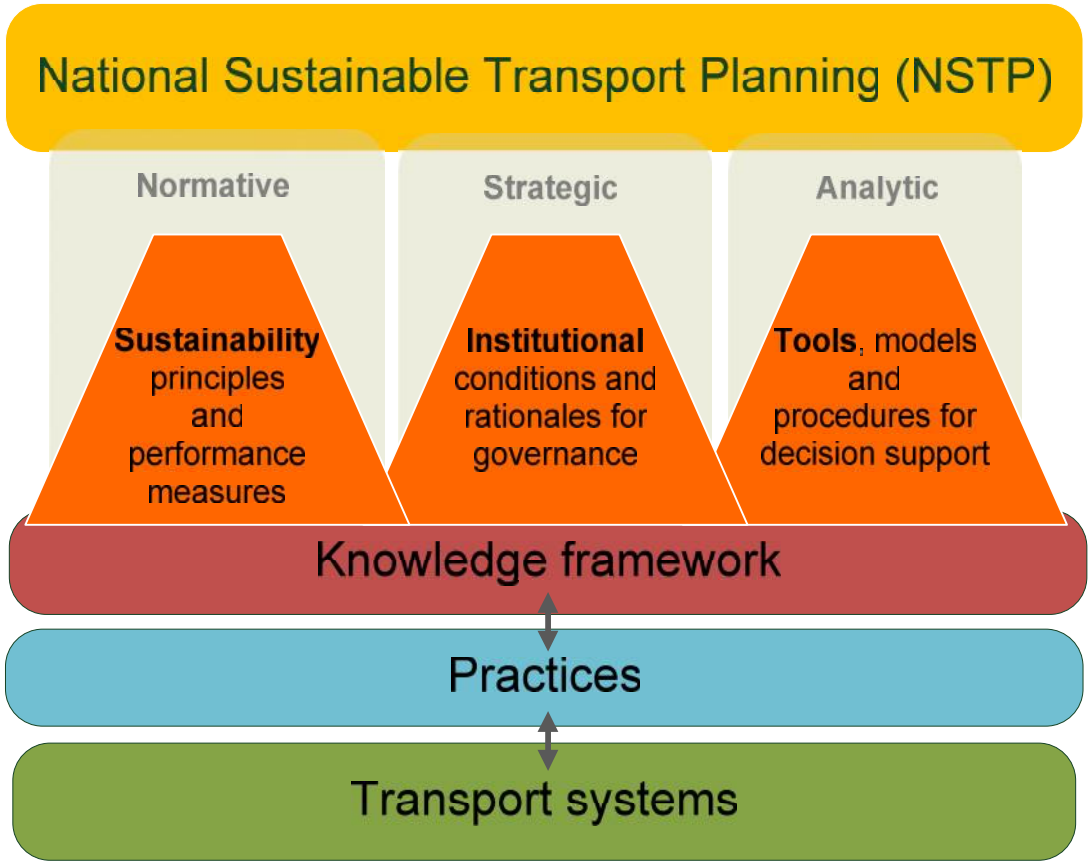


- European Union: indicators developed for the Mid-term Review of a transport white paper, Keep Europe Moving, 2006, in the so- called ASSESS study

Some conclusions

- Influence is more evident in the EU case than Sweden case
- Indicators attached to quantitative, political objectives obtain more attention than indicators not attached to objectives
- A regime of management by objectives and results increases use, but does not neccessarily produce more influence
- Indicators attached to (future) policy alternatives could be more influential than backward-looking indicators
- Engagement of policy makers in indicator design and development increases use and influence

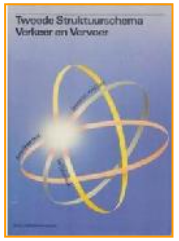
Example: SUSTAIN

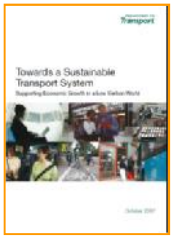


National Sustainable Transport Planning

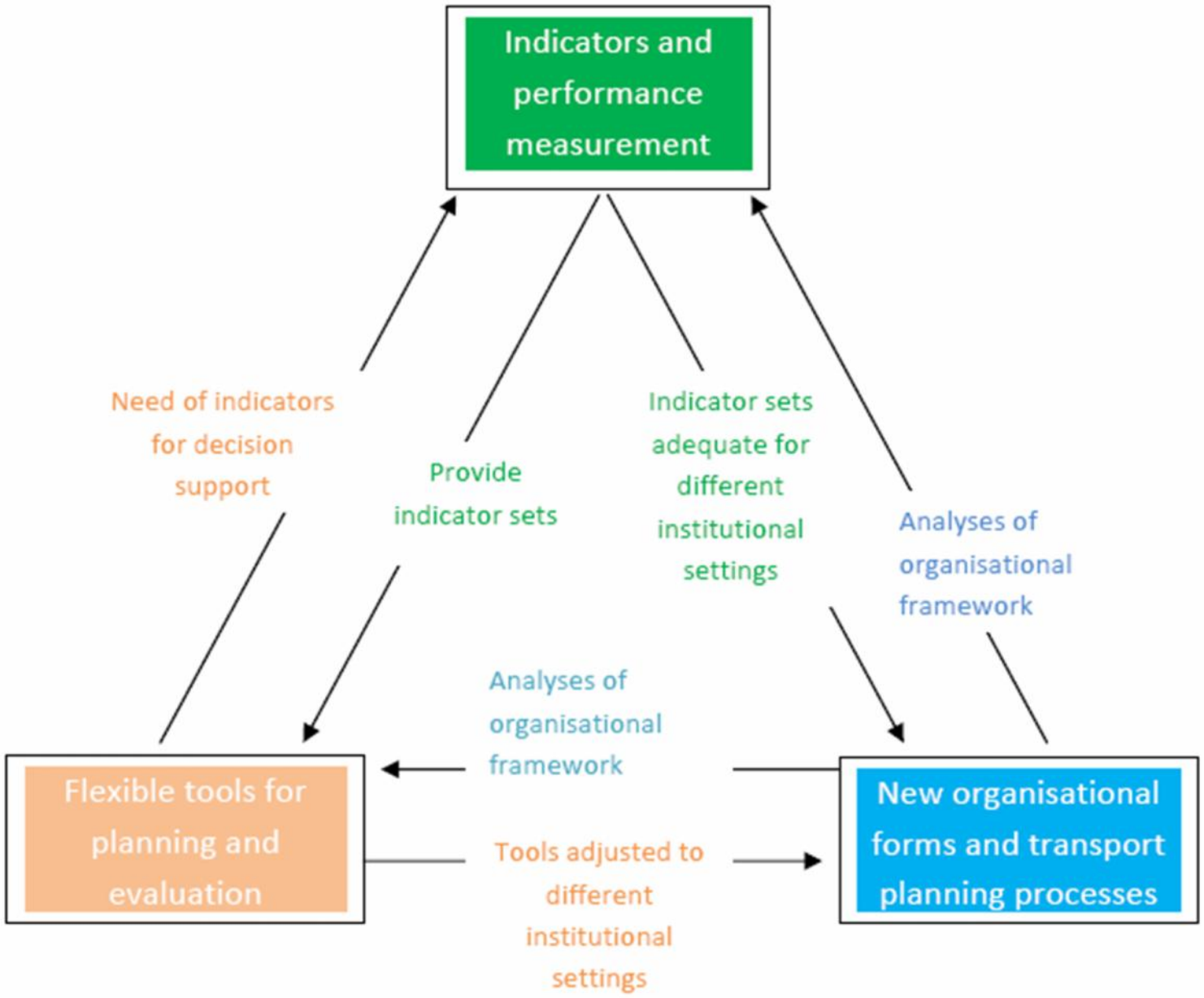
Working definition (?):

- Frameworks and procedures for integration of sustainability into the design and implementation of comprehensive national transport policies and plans

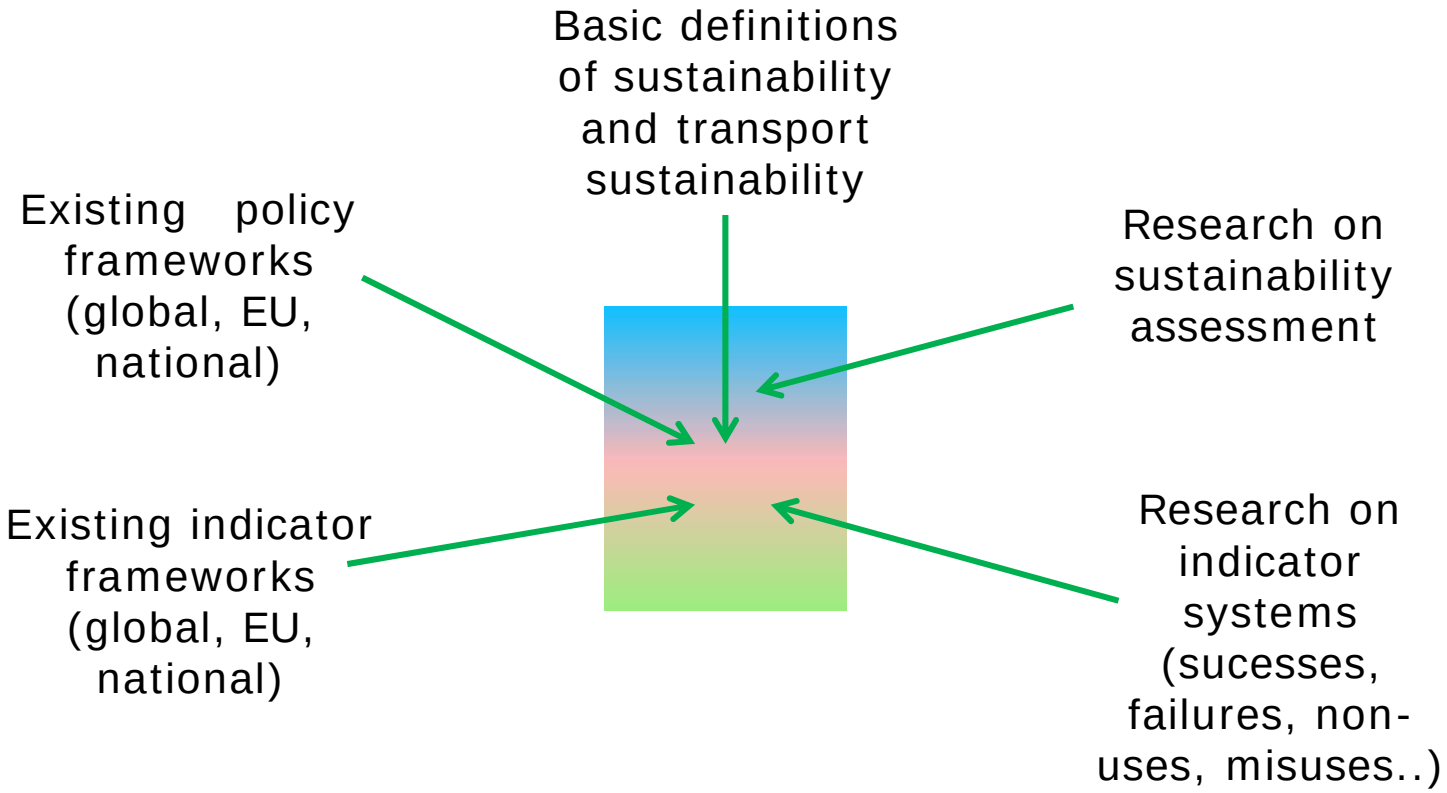


- What is role of central government plans compared to for example
  - public-private partnerships?
  - 'soft' governance frameworks?


Indicators and performance measurement
Need of indicators for decision support
Provide indicator sets
Indicator sets adequate for different institutional settings
Analyses of organisational framework
Analyses of organisational framework
Flexible tools for planning and evaluation
Tools adjusted to different institutional settings
New organisational forms and transport planning processes

Input to develop the a framework for performance measurement for NSTP...



4. Some Perspectives:

Important outside relations today

Organizations in the transport sector

- Danish Ministry of Transport
- Danish Road Directorate
- Trafikanalys, Sweden
- European Environment Agency
- Intergovernmental Panel on Climate Change (IPCC)

Research Communities

- Institute of Transport Studies, Leeds
- Oxford University, Oxford
- Transport Economics Institute, Oslo
- VTI, Swedish National Road and Transport Research Institute, Linkoping
- Aalto University, Helsinki
- Copenhagen Business School
- Texas Transportation Institute, College Station
- Aalborg University

Where to? – Some possible developmnts

- to establish and develop comprehensive assessment methodology, incorporating sustainability
- to produce international scientific publications on national transport policy frameworks, sustainability performance measures, and modes of knowledge use in transport policy
- to establish a definition and typology of transport governance institutions and mechanisms
- to produce a textbook on sustainable transport performance measures
- to develop teaching with regard to sustainable transport assessment and possibly transport policy and climate change
- to initiate another major joint project to further unite and consolidate the research theme on governence and appraisal